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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Ultrathin Tropical Tropopause Clouds (UTTCs): I. Cloud morphology and occurrence" *by* Th. Peter et al.

Th. Peter et al.

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We thank Jim Holton very much for his review. The following are our answers to the specific points he raised:

1. An additional reference not mentioned is the following: Holton, J. R. and A. Gettelman, Horizontal transport and the dehydration of the stratosphere, Geophys. Res. Letts., 28, 2799-2802, 2001. A major point of the above referenced paper is that horizontal velocities are typically orders of magnitude greater than vertical velocities near the tropical tropopause so that horizontal advection through "cold pools" near the tropopause must be considered in any discussion of dehydration. This seems consistent with the UTTCs discussed by Peter et al... In accordance with a basic mechanism suggested by Holton and Gettelman, the enhanced vertical motions required by UTTCs may also be related to inertia-gravity waves of short vertical and long horizontal scale. We fully agree with this point and make the suggested reference in the conclusions of

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Part II of our papers, where we discuss the relevance of the vertical winds required for UTTC existence.

2. Explain Şafter correcting for oversampling of particulate waterŤ of FISH hygrometer. ŞOversamplingŤ is a standard technical expression for aircraft-borne instruments being more sensitive for a species in particulate matter than for the same species in the gas phase. In particular, particle oversampling is a common property of forward looking hygrometers on aircraft, without which the cloud water could not be determined at all. The oversampling factor is estimated from the aerodynamic properties of the inlet configuration. We added this information to the manuscript and replaced the word ŞcorrectingŤ by ŞaccountingŤ.

3. Include a table summarizing the instrumentation on Geophysica. We appreciate this suggestion and will include such a table.

4. (a) Confusion with data of 24th and 27th February 1999. We eliminated this confusion by adding another figure to Part II of the paper (Luo et al.), where we now show the results for both days. (b) Upwelling close to the tropopause not ŞdrivenŤ by radiative heating. Sorry about this, we have eliminated the misleading words from Part II.

We have also taken the minor points into account. Thank you again.

Interactive comment on Atmos. Chem. Phys. Discuss., 3, 1557, 2003.

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Interactive Comment